GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated under the Federal law as a non-commercial institution for the increase of geographic knowledge and its popular diffusion.)

General Headquarters, Washington, D. C.

CONTENTS FOR WEEK OF MARCH 13, 1922. Vol. 1. No. 6.

1. The East Indies: Holland's Stake in the East.
2. Why the Winds Blow.
3. Astrakhan: City of Caviar and Cholera.
4. Poison Ivy—The Why and the How.
5. That Mysterious Melody, "The Star-Spangled Banner."

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PAPUAN CHILDREN OF NEW GUINEA (See Bulletin No. 1)

These children are at home in the water when they are very young. At an age when an American child would be demanding roller skates or a velocipede these children paddle about in tiny dug-out canoes of their own.

HOW TO OBTAIN THE BULLETIN

The Geographic News Bulletin is published weekly throughout the school year (thirty issues) and will be mailed to teachers for one year upon receipt of 25 cents (in stamps or money order). Entered as second-class matter, January 27, 1922, at the Post Office at Washington, D. C., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized February 9, 1922.

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The East Indies: Holland's Stake in the East

THE Dutch East Indies—a great colonial empire which gives the Netherlands one of the biggest stakes of all those held by non-Asiatic nations in the Far East—might be considered as exerting the force which brought the world to know itself. They are of special interest just now because of the world attention turned toward the Pacific, and also because of Holland's plans for a naval force to defend them.

Spices, known only to have originated in a mysterious land to the east, spurred the imagination and cupidity as well as the appetite of Europe. These islands were the magnets that drew Vasco da Gama around Africa, Columbus to North America, and Cabral to Brazil, opening up the way to vast unknown regions. And the other voyages of exploration which this quest for the "Spice Islands" initiated led eventually to the discovery of Australia, the finding of which may be credited to the lure of condiments.

Its Spices Gilded Venice and Lisbon

The East Indies were of economic importance to Europe even when they were little more than a tradition. Their spices, trickling through Arabia to Venetian traders, were transmuted into the beauty and power of Venice. Later this wealth went to build up Lisbon at its greatest; and for the past few centuries it has been poured into Amsterdam.

The Dutch possessions in the Far East, unlike those of England, are concentrated in a single area. Many of the islands are small, but included in whole or in part are some of the largest islands in the world. Holland owns half of New Guinea, the largest island outside polar waters; three-quarters of Borneo, second largest island; and all of Sumatra, fourth in size.

Sixty Times Size of Netherlands

From the longitude of central Burma to that of Tokyo, this great colonial empire of Holland stretches, largely below the equator, but in part astride it. Though much of this area is sea, there is not a single mile of the three thousand from central New Guinea to the western tip of Sumatra in which a north and south line would not cut Dutch land. The breadth of the Dutch zone is nearly 1,000 miles at its greatest and the land area is more than 771,000 square miles—60 times that of the Netherlands. If this great archipelago were spread out in the Western Hemisphere it would extend from San Francisco across the United States and out in the Atlantic to the Bermudas, each of its larger islands covering groups of our States.

Java, fifth in size of the Dutch islands, is probably best known, and for good reason. Enthusiastic observers have called it "the garden spot of the world." Its soil is constantly enriched by active volcanoes, it is well watered, and four out of every five acres of its surface are cultivated. Even mountain peaks 10,000 feet high are girdled by unbroken fields up to half their height, above which forests still hold sway.

World's Most Crowded Land

Java, with its 50,000 square miles of area, has a population of about 35,000,000—one-third that of the United States, which is 70 times as large. Compared with

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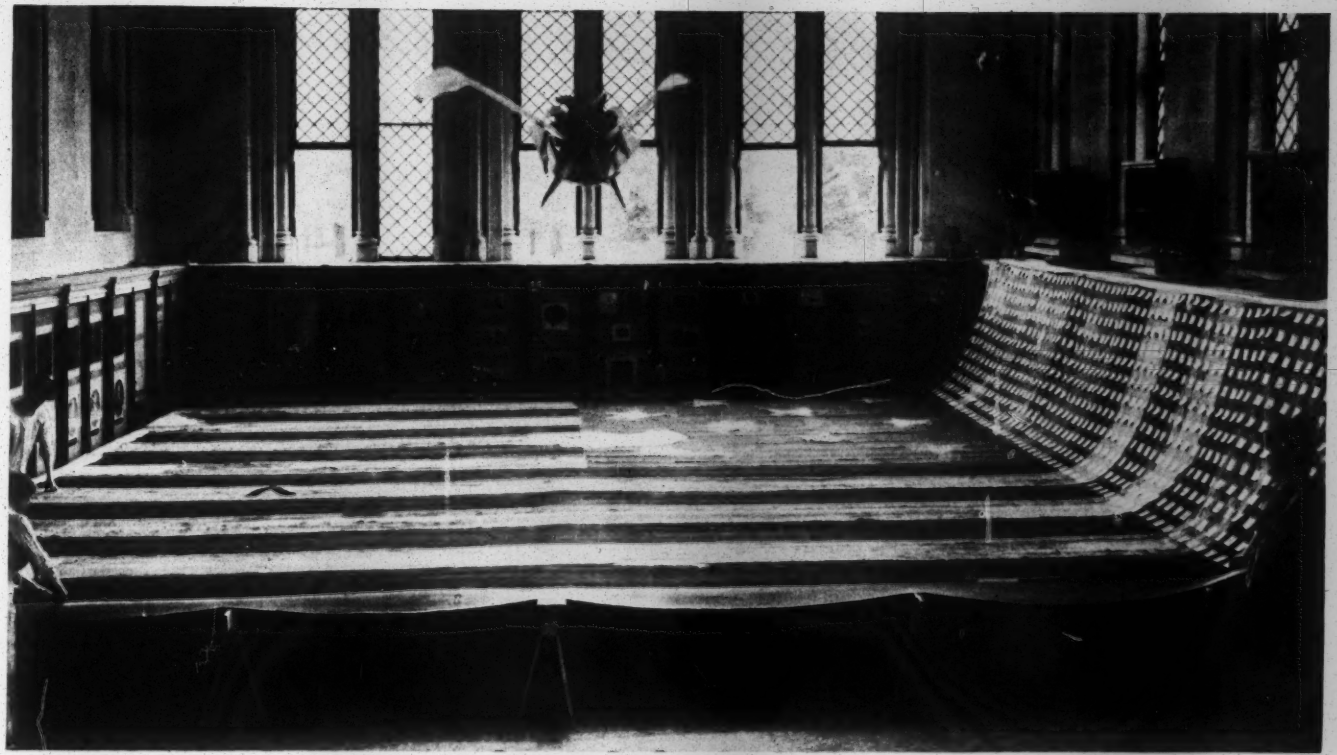

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THE ORIGINAL "STAR SPANGLED BANNER" OF OUR NATIONAL ANTHEM

The National Flag which flew over Fort McHenry in the War of 1812 is carefully preserved in the U. S. National Museum at Washington. In the illustration expert needle-women are shown restoring the banner and mending its rents. The white tags on the flag, at the right of the picture, were used in checking the work of each repairer. Every American school-boy knows the story of Francis Scott Key's errand, under a flag of truce, to the British fleet during the attack on Baltimore in September, 1814. Detained on board an enemy ship, he watched the bombardment of Fort McHenry, Baltimore's defense, during the night of the 13th. In the morning he was thrilled to see the Stars and Stripes still waving triumphantly. Whereupon he wrote his famous poem which is now the National anthem. (See Bulletin No. 5.)

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Why the Winds Blow

TO THE LAYMAN, the world's rotation plays queer pranks with the atmosphere, but scientists find the various swirls following fairly definite laws. The world's winds and their complexity are believed to be due, in general, to two forces: the rapid rotation of the earth which is imparted to the air surrounding it, and modifications of this motion due to differences in temperature on the earth's surface.

If the temperature differences did not play a part in the matter, it is probable that there would be only west winds in the temperate and polar zones, and no winds at all in the tropics. The situation would be somewhat like that brought about in a glass of liquid at a soda fountain into which a rotary stirrer is introduced. The liquid swirls faster and faster until finally it attains practically the speed of the rotating rod. So, but for temperature differences, the earth would have the great sea of air which surrounds it swirling with it practically at the speed with which the earth moves at the equator—approximately a thousand miles an hour. But since both the earth and the air at the equator would be moving at the same speed, there would be no wind there.

Air Would Outrun Earth

As one went from the equator he would find a wind blowing harder and harder as he approached the poles. This wind would be from west to east, the direction in which the earth is turning, and would result from the fact that the air was turning through space actually faster than the earth. For while the surface of the earth at the equator is moving at about a thousand miles an hour, being on the "rim of the wheel," so to speak, the surface in the temperate zones, being nearer to the "hub," is moving at a slower speed. But the air above the equator, swirling at a thousand miles an hour would communicate its speed to the air on each side of it and would tend to throw the entire atmosphere to spinning at the rapid equatorial rate. As a result it would outrun the earth between the equator and the poles and create a mighty west wind.

As a matter of fact, much of this assumption is true. The earth does impart its rotary motion to the atmosphere in general, but because of counter influences and side currents due to temperature differences, the assumed calm is not found in the tropics. Instead the earth outruns the air somewhat there, and the air, "dragging" as the earth spins under it, makes winds blowing from the east—the famous trade winds. Even though the atmosphere is moving eastward more slowly than the earth at the equator, it is moving faster than the earth in the temperate zones, and there the prevailing winds are from the west.

Great Air Stream Seven Miles Up

Temperature differences, of course, change the general directions of these "planetary" winds, especially at the surface of the earth. But in the United States at an elevation of six or seven miles a nearly constant wind may be found blowing from the west at from 60 to 75 miles an hour.

There seems to have been much over-optimism in regard to speeds that can be attained by aircraft with the help of these planetary winds. It has been

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other geographical units of its size, it is probably the most populous as well as the most prosperous region in the world. Most of the inhabitants live in villages. Although it has only four cities as large or larger than Reading, Pa., the density of population for the island as a whole is close to 700 per square mile—greater than that of Belgium, the most crowded country in Europe, or Shantung, the most heavily populated province in China.

The other islands of the Dutch East Indies form a contrast to Java. Sumatra, three times as large, has a population of little more than 4,000,000; and though closer to India and Europe, does not show anything like the same degree of development and prosperity. Only the fringe of Borneo and New Guinea have been touched, and development has not been carried far, in comparison with Java, in many of the smaller islands.

A number of the small islands are uninhabited, and in many others the population is sparse. This is a result of the picturesque but destructive pirate empires of Ternate, Tidore, Boni and Gowa, which flourished in the eastern part of the archipelago, growing rich on spoils from the sea trade around the Malay Peninsula. Gradually the Dutch closed in on these pirate strongholds, and when steam gunboats and steam launches came into use, ended their activities.

"Denatured" Mohammedanism

Holland's Far Eastern subjects are mostly of Malayan stock; but situated at the "gate" of a great world highway, it is natural that they have received a considerable admixture of other blood. Most of the natives are nominally Mohammedans, but they lack the fanaticism and strictness of many of that cult. Holy days are not observed strictly, pork is widely consumed, and there is little seclusion of women.

In governing Holland leaves native rulers in nominal charge, but places them under the control of Dutch officials. Conditions in Java, which was not affected by the pirate empires, furnish a good measure of the success of Dutch control. Two centuries ago 2,000,000 people lived in the island. Since then the population has increased seventeen fold, and still the people are prosperous.

Bulletin No. 1, March 13, 1922.

OPEN MARKET AT ASTRAKHAN, ON THE VOLGA, IN NORMAL TIMES (See Bulletin No. 3).

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Astrakhan: City of Caviar and Cholera

SUGGESTIVE of luxury and wealth because of its importanee as a shipping point for caviar, and because it has given its name to the fine "fur" which is made from the skin of unborn or new-born Persian lamb, Astrakhan now is all but annihilated by the succession of famine, pestilence and the revolution which was the culmination of its woes.

Although it is more than sixty miles from the deep waters of the Caspian, the Volga having built up a shelving bottom which makes the northern portion of the Caspian very shallow, Astrakhan is regarded by many as the main Caspian port and actually has but one rival for that honor, the oil city of Baku.

First Touch of the Orient

It was at Astrakhan that the traveler from Russia first felt that he was in the Near East. From Kazan south, there had been Tatar hamals loading the comfortable passenger boats which made the monotonous Volga a pleasure route. But in Astrakhan the number of Persians, Tatars, Armenians and Kalmucks that one met gave a distinctly Oriental and Asiatic touch to the Russian city.

Destruction of many buildings by fire during recent disturbances recalls that the burning of Astrakhan was contemplated some months ago as a drastic means to check a cholera epidemic. Time and again the city sites which correspond to the present city have been razed. Originally, it was a prominent Tatar capital, although the ancient site is seven miles farther up the river than the present sprawling city. This city was destroyed by Timur, the lame Tatar chief. Early in the eighteenth century it was partially destroyed by fires, and ravages of cholera have been felt time and again, the epidemic in 1830 wiping out thousands of its people. In the spring of 1918 a large portion of the city was again burned in fighting between the Bolsheviks, who held the city, and their enemies, who advanced over the flat alluvial plains that are threaded by the various mouths of the Volga.

Scene of "Thieves' Market"

A white-walled Kremlin, dominated by a bell tower which the Bolsheviks used as an observation point and a viper nest for snipers, occupies the center of the city, and outside the principal gate there was held one of the picturesque "thieves' markets" for which Russia is famous. Only a junk dealer could enthuse over such a collection of odds and ends, to which only those in a dire state of poverty could ascribe a value.

More interesting than this market of cast-off goods or of the rich shops of the real bazaar, where many an Austrian war prisoner captured the simple hearts of the Russian girls with uniforms which were frequently exchanged for new ones from Vienna, is the river front where the fishing boats line up after the day's catch. Many of these contained deep tanks and the custom was for purchasers to pick out their fish according to their agility and color. There was also a large tank in which live sturgeon swam around as peacefully as the strutting gobbler on the eve of Thanksgiving.

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stated in some instances that in upper currents moving at three hundred miles an hour, airplanes with powerful motors could reach speeds of four or five hundred miles an hour. The difficulty is that no winds have been found in the upper air by the United States Weather Bureau in many years of observation that much exceed 100 miles an hour; and the normal speed of the west winds at high altitudes over the United States is between 60 and 75 miles an hour. If such tremendous speed as that suggested is to be attained by airplanes, therefore, the motors will have to be responsible for the greater part of it.

The winds of highest velocity have been found about six or seven miles above the sea at the level of the highest clouds. Both above and below this level the speeds fall off.

Small Balloons Furnish Evidence

The rates of motion have been checked very carefully by observing the drift of special rubber balloons. The observations are made through telescopic instruments from the ground. Similarly the drift of clouds has been observed and measured. Thousands of such observations have been made, ranging from slight distances above sea level, to the upper reaches of the clouds, and in the cases of balloons, far beyond the cloud zone. One balloon sent up by the Weather Bureau reached a height of nearly twenty miles.

The winds of the upper altitudes, in addition to keeping the atmosphere stirred up, affect weather in another way under exceptional conditions. When volcanoes throw dust and ashes into the upper air—sometimes fifteen or twenty miles up—the planetary winds quickly spread the particles, forming an envelope entirely enclosing the globe. This sheath screens off many of the short heat waves coming from the sun but does not interfere materially with the passage outward of the longer heat waves radiated by the earth. The earth therefore loses heat in two ways, and as a result the average temperature all over the world is lowered for some time after the more violent volcanic eruptions.

(Note to science teachers: It will be realized, of course, that the explanation herein given is an attempt to present the fundamentals of a most abstruse subject in reply to one of the earliest and simplest questions of every child. While it summarizes the generally accepted conclusions on the subject, it does not take into account some important recent studies, such as those of Charles F. Marvin's "The Law of the Geoidal Slope and Fallacies in Dynamic Meteorology," which cannot easily be apprehended even by pupils with elementary science training.)

Bulletin No. 2, March 13, 1922.

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General Headquarters, Washington, D. C.

Poison Ivy—The Why and the How

"LOOK OUT for that poison ivy" will be an oft repeated cry when picnic days arrive.

To know the poison ivy is to avoid it, yet to admire it for its sturdy self-defense. An article on "Common American Wild Flowers," in the *National Geographic Magazine*, explains:

"The poison ivy is a member of the sumac family, having as relatives the vinegar tree, the smooth sumac, and the smoke-bush. Its range reaches as far north as Nova Scotia, as far south as Florida and Texas, and as far west as Utah and British Columbia.

"Many people confuse the Virginia creeper with the rascally poison ivy, a confusion which nothing but carelessness in remembering the characteristics of plants could bring about; for the Virginia creeper is careful always to put forth five leaves where the poison ivy has only three.

Confused With Virginia Creeper

"The Virginia creeper is condemned as being poison ivy oftener than poison ivy is accredited with being a Virginia creeper. Many a Virginia creeper has reached the untimely end of mattock execution by the error, and not a few people have received a painful reminder of their mistake when they have failed to observe that three leaves spell 'foe' in the ivy vine and five leaves 'friend.'

"The poison ivy, or poison oak, as some call it, is a prodigal climber, inclined to run over everything in sight. Even the oak sometimes is almost smothered when the poison ivy reaches its topmost branches and spreads its dense foliage over them.

"It begins to blossom in May and June, its flowers being small, fragrant, yellowish green, and arranged in densely clustered spikes. Toward fall these develop into smooth, white, wax-like berries that often hold fast the winter through. The three leaves are shining green, short-stemmed, and oval-pointed.

Effects of the Plant's Poison

"The poison of this ivy is a powerful, non-volatile oil which penetrates the pores of the human skin and develops hosts of tiny itching blisters, followed by a burning swelling of the affected parts.

"While we very naturally dislike a plant that poisons us when we touch it, yet if we investigate the reason for its poison we discover that a vast number of plants develop poisons and near-poisons, and when we look over the list we find that we would be rather badly off without them. It is true that most of them are poisonous only when eaten, and that few are poisonous to the touch, but they have all developed these qualities in self-defense.

"Some of them store their poison in their seeds, others in their root-stocks, and others in their roots to protect their progeny from harm. They do not go about looking for trouble or seeking, like the devil, whom they may destroy; but they are prepared to resist invasion of the rights of their children. Nux vomica and aconite are two of many such illustrations that might be cited.

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Some of the fish secured were huge specimens, several hundred pounds in weight, but the main profits were from the roe or caviar from the sturgeon. That of Astrakhan was usually of the coarse red variety, although there was enough of the delicate black kind to spice the *zakushka* which formed the preface to the huge volume of Russian eating from Kiev to Kiakhta. But in general only a small portion of the world's caviar and almost none of the Astrakhan "fur" actually comes from Astrakhan. To the traveler who lands in this lower Volga city in autumn the charm of *hors d'oeuvres* and Persian lamb is likely to be subordinated to the delight that one experiences from sampling the delicious grapes for which Astrakhan and its neighbor port Petrovsk are famed.

War Hurt Caviar Market

During the war the market in caviar declined sharply. The Fair at Nizhni Novgorod, nearly fifteen hundred miles up the Volga, where most of the caviar was sold, languished with the breakdown of transportation which preceded by many months the triumph of the Bolsheviks. Although Astrakhan is a center for much crude cattle raising by exotic Kalmuk and Kirghiz breeders, it has had to depend for much of its grain upon the North Caucasus or the black earth belt higher up the Volga. Astrakhan is one of those cities whose approximate locations are determined by geographical forces and if the city were destroyed, there is every reason to feel that another nondescript, polyglot river town with its packing houses and cold storage plants and fishing fleets will rise above the low-lying flats upon which the present city stands.

Bulletin No. 3, March 13, 1922.

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That Mysterious Melody, "The Star-Spangled Banner"

FORT McHENRY, recently acquired by the city of Baltimore, Md., to be used as a public park, always will be associated with the origin of America's national anthem.

Nearly every schoolboy knows that the defeat of a British attack upon Fort McHenry was the occasion for writing "The Star-Spangled Banner"; but how Francis Scott Key's ode came to be set to the tune of a convivial British song is yet a matter of controversy.

The melody has had an international history, from the time of its remote origin, which has even been ascribed by some to Ireland and by others to Germany, through its vogue in England 150 years ago, its adoption as the American national air, its employment by an Italian composer in an opera of Japanese life, down to the more recent refusal of a German conductor of a New England orchestra to play it in connection with symphony programs.

"It Can't Be Sung"—But Everybody Sings It

Another paradox about the tune may be noted, purely from an historical and not from a critical standpoint. Though many musicians aver that because of its wide range it cannot be sung easily, the general public has always insisted upon singing it. Long before it had any patriotic significance it was the "Tipperary" of its day in English tavern and coffee house; and it had a vogue in the United States before Key fitted his triumphant ode to its rhythm, or before the actor, Durang, chose that tune for Key's words—according to which side one takes on that point.

When "Our Flag Was Still There"

Fort McHenry, on Whetstone Point, Patapsco River, at the entrance to Baltimore harbor, is an historic shrine not only because it provided Key with an inspiration for his poem, but because that dawn of September 14, 1814, when "our flag was still there," marked an American victory of courage and consequence.

Three days earlier a small fleet of British vessels appeared off North Point, carrying some 6,000 veterans of the Duke of Wellington's encounters with Napoleon's troops. Gen. Robert Ross, their commander, had threatened to make his winter quarters in Baltimore even if the city "rained militia." After a land attack had been repulsed and Ross shot, the fleet, under Admiral Cockrane, launched upon Fort McHenry a terrific bombardment which lasted through the day and night of the thirteenth. It suddenly ceased just before daybreak on September 14.

Wrote Poem on Back of Old Letter

A young Washington lawyer and poet, Francis Scott Key, had gone aboard Admiral Cockrane's flagship before the attack to negotiate for the release of his friend, Dr. William Beanes, of Upper Marlboro, Md., who had been taken prisoner by British soldiers. Key was courteously treated, but was held lest he betray plans of the attack upon Baltimore. Thus he had a point of vantage throughout the operations. When the firing ceased, and he beheld the flag

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Many Other Poisonous Plants

"Others develop alkaloids, like the nicotine of tobacco, the quinine of the cinchona tree, and the theine of tea, to protect themselves. Strychnine, digitalis, and a hundred and one indispensable drugs that are poisonous in overdoses are the gift of the plant world to man as a by-product of plant preparations for self-defense.

"And so, when the poison ivy learned to give off its poison by contact rather than through its own destruction, it simply went a step further than its neighbors. It has arranged its plans of defense, so that it can wage war without first being eaten. In that respect it meets the problem in the same way as the thistle and the thorn, although it fights by subtle stealth rather than open warfare."

Bulletin No. 4, March 13, 1922.

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THE TYPICAL RICE-HULLER OF BORNEO

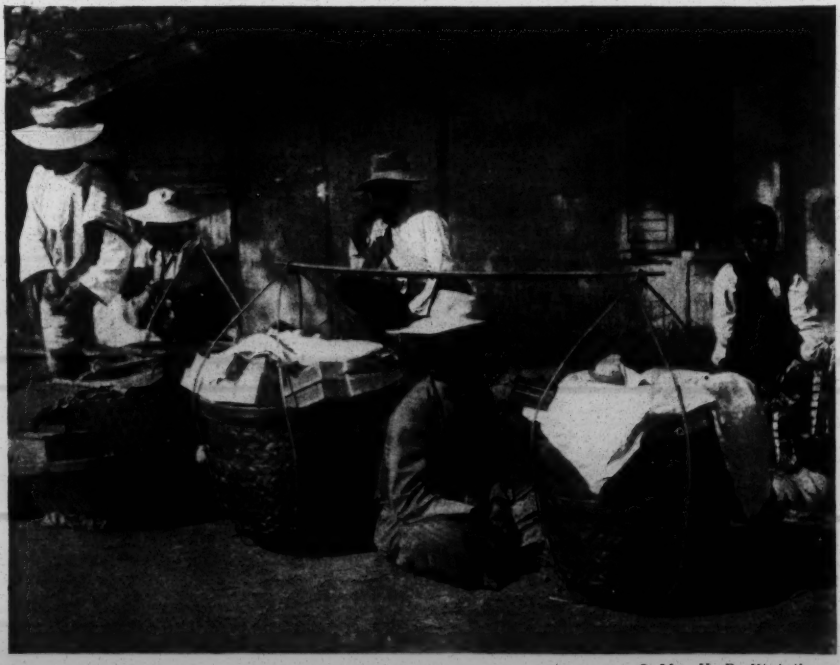
This implement is made of extremely hard wood. The part on the right fits down over the other piece. This cap piece is grooved on the inside, and the two pieces fit together, making an excellent huller.

of Fort McHenry he scribbled hastily the notes for his poem on the back of an old letter, and, upon reaching Baltimore, revised them.

The words were printed in Baltimore, and they were first publicly sung at the Holliday Street Theater there to the tune which hitherto had been associated with a convivial song known as "To Anacreon in Heaven."

Oliver Wendell Holmes, who wrote a stanza sometimes used as a substitute for the third verse penned by Key, remarked that three short poems, each the best of its kind in America, were written in Baltimore. The other two were "The Raven," by Edgar Allan Poe, and Randall's "Maryland, My Maryland."

Bulletin No. 5, March 13, 1922.



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BURDEN BEARERS OF JAVA (See Bulletin No. 1)

The Dutch East Indies have for centuries supplied the Western World with many spices and raw drugs. Tens of thousands of tons have gone to market in such baskets as these.